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Ms Jillian Broadbent, AO  
Chair, CEFC Expert Review Board  
The Treasury  
Langton Crescent  
Parkes ACT 2600

## Submission to the CEFC Expert Review from CalCEF Angel Fund

1. The CalCEF Clean Energy Angel Fund is pleased to provide this submission to the CEFC Expert Review Panel.
2. The CalCEF Angel Fund was created by the California Clean Energy Fund (CalCEF, see [www.calcef.org](http://www.calcef.org)) in 2007 to address a capital market barrier at the seed stage of clean energy financing. The CalCEF Angel Fund is part of the CalCEF family, and just one of CalCEF's initiatives aimed at capital market barriers.
3. The mission of CalCEF is the serial creation of institutions and investment vehicles that accelerate the adoption of clean energy technologies, along the continuum of innovation to infrastructure.
4. There are clearly very strong parallels between the mission of the CEFC and CalCEF, and therefore CalCEF may be able to make useful contributions to the review, and perhaps even the ongoing work of the CEFC.
5. While Australia shares many barriers to clean energy with other regions of the world, there are both major differences and nuances. Therefore, rather than attempt an analysis of the situation in Australia, we would like to propose some approaches to capital market problem solving that CalCEF has pioneered in the US.
6. ***Our essential message is this:***
  - a. ***One of CEFC's key roles is the mitigation of risk and the management of perception of risk.***
  - b. ***The availability of capital at a given risk-return profile will vary by application, technology, jurisdiction, geography and time. So there are multiple gaps and probably no permanent set of "silver bullets".***
  - c. ***CEFC will therefore need to have a product development function strongly linked to the market in order to continually innovate.***
  - d. ***Thus CEFC should design a process to identify, analyze, ideate, test solutions and ultimately, to scale them. Likewise the organization needs to be structured for these purposes and the principals incentivized accordingly.***
  - e. ***Like CalCEF, the CEFC will need a strong emphasis on implementation and its role as first mover / lead investor will be critical to success.***
7. Before responding to each of the questions, we will provide some context around both the author of this response and the CalCEF organisation.

8. The views expressed in this document are the author's and do not necessarily reflect the views of CalCEF or the CalCEF Clean Energy Angel Fund. I am an Australian citizen who has lived in Silicon Valley for over a decade. Before joining the CalCEF Angel Fund in 2009, I was the founder of a technology commercialization firm which served several investors, governments and R&D institutions from Australia. Previously, I was founding CEO of SC Power Systems, which commercialized grid-scale energy technology from Australia and is now listed on the AIM as Zenergy Power (ZEN). Before that, I was VP Operations Development at Flextronics and the CEO of a fuel cell company backed by Flextronics. In other roles, I built the first mobile phones made in Hungary; was a strategy consultant at PA Consulting Group during the de-regulation of the Australian electricity and water markets; and was operations manager for one of Australia's largest construction organizations. I began my career building water and power systems in remote localities. I am an honours graduate of UNSW, UQ and Monash.
9. Founded in 2004, the California Clean Energy Fund (CalCEF) is an independent nonprofit corporation working to advance clean energy using tools from finance, public policy and technological innovation.
10. CalCEF works to promote the transition to a clean energy economy by creating institutions and investment vehicles that grow markets for clean energy technologies.
11. CalCEF pursues state-wide and national agendas via two affiliated entities:
  - a. CalCEF Innovations, a nonprofit corporation under U.S. tax code section 501(c) (3), leads CalCEF's analysis and product development, designing real-world solutions (market strategies, business models, and public policies) to rapidly advance clean energy adoption.
  - b. The California Clean Energy Fund, an organization under U.S. tax code section 501(c) (4), executes and scales the CalCEF investment strategy via a fund-of-funds model, partnering with leading investment managers. The investment strategy primarily consists of a \$30 million nonprofit evergreen venture capital fund formed in 2004 to accelerate the development of promising early-stage clean energy technologies - the first of many gaps identified in the market.
12. CalCEF invests in clean energy companies throughout the United States and any profits from the investments are redeployed to further the organization's mission. CalCEF's fund-of-funds early-stage portfolio includes investments in more than 40 companies in the low-carbon transport, cleaner fossil fuels, energy efficiency/energy intelligence, green building/green consumer, energy storage, and renewable generation spaces.
13. Other investment vehicles pursued by CalCEF address market gaps beyond early-stage venture capital financing, such as a syndicated tax equity platform, new ways to access retail investors for clean energy projects, or new funding mechanisms to further energy efficiency adoption.
14. In terms of process, CalCEF has been developing an approach to identifying specific gaps, engaging market participants, proposing solutions (which may be a mix of policies, financial instruments and new organisations) and then implementing them. In a sense CalCEF has a "product development" process for addressing those gaps, leading ideas, and potential implementation avenues.
15. This product development approach has been utilized in the past by CalCEF, e.g.:

- a. In 2004, when there was a lack of capital flowing to clean energy companies, CalCEF pioneered one of the clean energy industry's first venture capital fund-of-funds. The fund-of-funds partnered with Nth Power, Element Partners, and VantagePoint Venture Partners to catalyze investment in the sector.
  - b. Addressing the lack of seed stage capital, CalCEF is the founding limited partner of the CalCEF Clean Energy Angel Fund, a for-profit entity with multiple individual and institutional limited partners. (The author is a member of this entity).
  - c. Observing a lack of energy efficiency investment, CalCEF explored new models to finance energy efficiency and incubated Metrus Energy. Metrus Energy promotes energy efficiency projects through an efficiency services agreement, whereby customers pay for efficiency in a model akin to a power purchase agreement. Metrus has successfully spawned many imitators.
  - d. CalCEF recently launched Clean Energy Advantage Partners to address issues in the tax-equity market which were constraining large renewable energy projects.
  - e. CalCEF is currently developing solutions for financing energy efficiency in low income housing and insuring risk in large projects.
16. The product development approach generally follows the model of identifying a pain point in the financing and deployment of clean energy technologies, analysis of the market gap, research and create solutions, test the solutions with stakeholders, and ultimately, scaling the solutions in the market. As a result of these efforts, CalCEF has been a first-mover in many market gaps and serves to catalyst the flow of private capital once CalCEF proves out the investment thesis with its more patient capital.

## **Q1. How do you expect the CEFC to facilitate investment?**

1. Essentially the CEFC must use public capital to mobilize private capital, with a decreasing proportion of public capital over time. To do that the CEFC must adjust the risk/return profile for private capital in order to attract that capital.
2. The CEFC may not need to assume the full risk, but can attempt to disaggregate risks into component parts (credit, production, weather, technical, construction etc) and assume, insure or otherwise mitigate that portion the private sector is currently unwilling to assume.
3. Private capital's perception of risk/return profile of a particular asset can be changed through practical example. The CEFC could therefore develop new financial products then prove their effectiveness to the market with the intent of creating commercial imitators.
4. Thus CEFC's role should perhaps be defined as one of developing and implementing risk mitigation solutions, and modifying private capital's perception of risk, rather than solely providing capital.
5. There are a range of tools that the CEFC may use, including combinations of debt, equity, securitization, and loan guarantees. CEFC might also act as an anchor LP in a private fund. CalCEF has used this model successfully once a specific solution has been developed. In general the intent is to create imitators.
6. One lesser known tool is the use of insurance to manage specific project risks in the pilot/first commercial valley of death. CalCEF has issued a white-paper on this topic (enclosed) that identifies insurance products and policy solutions. Insurance products would limit the exposure of lenders and other financiers to technology performance risk potentially resulting in reducing the cost of developing energy

projects using new technologies by 10-20%. Actionable items that CEFC can pursue include: improve underwriting data through new information service providers that aggregate data to help insurance companies assess the distribution of performance outcomes and failure rates; create a clean energy insurance coalition; and create new primary insurers, managing general agents, and re-insurers. As an example, CalCEF recently partnered with the SolarTech, an industry trade association, to form a technical working group that will seek solutions that cut the risk in photovoltaic projects less than 1 MW in size.

7. CEFC could also help support the standardization of financial instruments or bundling of smaller projects to help reduce the transaction costs for smaller projects, which is a major impediment to distributed generation and energy efficiency.
8. Another option could be venture debt for well funded later stage technology companies which could extend the runway for these companies and support them through the prolonged demonstration and first commercial project phase.
9. In the US we have observed that the market both evolves and reacts to macro-economic environment. For example project finance was largely driven by tax-equity which evaporated during the global financial crisis. The government responded with cash grants in lieu of tax credits, which sustained project financing in the short-term but gave rise to the conclusion that a new model of tax equity financing is needed in the marketplace. A model solution is to transition the market from highly tailored one-off transactions with a bulge bracket financial institution to facilitating the ability to syndicate investors from regional financial institutions and corporate investors. CalCEF recently participated in launching Clean Energy Advantage Partners to address these issues.
10. The above examples illustrate the need to continually innovate, and therefore the need for a product development and demonstration function within CEFC.

## **Q2. Are there principles beyond financial viability that could be used to prioritise investments, such as emissions impact or demonstration affect?**

1. Yes, both emissions impact and demonstration effect are important.
2. Given that climate change is a key driver, emissions should be taken into consideration.
3. The demonstration impact is important for new technologies, first commercial projects, new financial instruments, and poorly-rated credit.
4. Not only should the project be viable, but also the underlying market, business model, and technology. Several failures in the US Loan Guarantee program can arguably be traced to insufficient due diligence on these aspects.
5. We believe this problem could be exacerbated in Australia due to the scale of the local market and shortage of experienced clean technology investors. We recommend the involvement of international experts to ensure that, given the small size of the Australian market, a particular technology has a sustaining global market.

## **Q3. What are the opportunities for the CEFC to partner with other organisations to deliver its objectives?**

1. Development of new financial product concepts could be a good area for partnering.
2. CEFC has the opportunity to benefit from recent experience in Europe and the US.

3. The European experience with CDM and JI projects may also be instructive, especially efforts to bundle smaller projects to address transaction costs.

#### **Q4. How could the CEFC catalyse the flow of funds from financial institutions?**

1. See Question 1.
2. The CEFC must not only fund, but also innovate and take a leadership position in order to demonstrate new models.

#### **Q5. What experiences have firms in the clean energy sector had with trying to obtain finance; have term, cost or availability of funds been the inhibitor?**

1. Yes, term, cost and availability are important, but only part of the problem.
2. For example, in the US, one major barrier was the cost of obtaining the loan guarantees.
3. Small size and high transaction costs are a barrier to energy efficiency and distributed generation projects below 10MW.

#### **Q6. What non-financial factors inhibit clean energy projects?**

1. There are many non-financial barriers. For example, “bankability” is a major factor in introduction of new technologies. Principal-agent is a problem for behind the meter distributed generation.
2. Tax regimes and incentive programs can be a major issue. For example, in the US, a large portion of incentives and financing has been derived from tax credits and other tax-related instruments at the federal level. Although state- and regional-level policies exist, they are uncoordinated and often-times highly specific to the state or region. While these policies are helpful, a paradigm that removes the obstacles inherent in political process or jurisdictional boundary lines is needed. CalCEF has been researching and advancing thinking on new models to allow retail access to clean energy investments. These models can be adapted from existing models in use today in real estate investments (i.e. real estate investment trusts) or natural resource space (i.e. master limited partnerships).
3. Therefore capital market barriers cannot be solved through financial activities alone, there must be a strong policy, technology and business model element to the solution. CalCEF therefore maintains a diverse base of stakeholders (leading investment firms, policy makers, academics, scientists and advocates) who provide a constant stream of insights into the challenges facing this unique and critical industry. This network contributes to CalCEF’s greatest strength: the ability to implement and drive solutions into the public and private marketplaces.

#### **Q7. Are there special factors that inhibit energy efficiency projects?**

1. Again, there are many barriers. A key barrier is principal-agent, i.e. the building owner owns the assets, but does not pay the utility bill. Another serious barrier is archaic, fragmented and/or innovation resistant incumbents or channels to market (e.g. HVAC or lighting). A related problem is the ability of small installers to offer financing. This has been partially solved in the solar field.

2. Another example from CalCEF: During the summer of 2011, the California Public Utilities Commission issued a [report on energy efficiency financing](#) in California. The main thesis of that report was that energy efficiency investment would benefit greatly from models that sold energy efficiency as a service, essentially validating the Metrus business model and the related efforts at CalCEF. The efficiency as a service idea removes the up-front capital cost of investment from the calculus, in addition to re-purposing a business's operations expenses and providing an off-balance sheet mechanism to obtain energy efficiency.

## **Q8. How do you see the CEFC fitting with other government initiatives on clean energy?**

1. Conventional wisdom is that there are financing gaps at the seed stage, demonstration project stage, and first commercial project stage. Although in Australia there are also gaps in the late venture capital and commercial project stage,
2. Given the existence of several programs which will address the earlier stage technology development (e.g. various grants, the REVC and the RE Demonstration Program) it may be most appropriate for CEFC to support later stage venture debt, large scale demonstrations, first commercial projects and commercial projects.
3. We do have a major concern in terms of interaction between all the Australian Government bodies and initiatives (see Item 4 in the terms of reference). We are concerned that responsibilities for quite similar financial assistance and policy programs are split across multiple government departments, and in particular that clean energy and energy efficiency are separated in most cases (with the exception of the CEFC). We believe that in the interests of economic efficiency, energy efficiency should be given a leading priority in the "loading order" of clean energy sources. One approach might be to group energy efficiency activities with ARENA.
4. Moreover, in regards item 2.2 of the terms of reference, we are concerned that the division of the funding into two streams each with one half of the funding may be too prescriptive and lead to favouring generation over energy efficiency to the detriment of climate change impact and cost effectiveness.

Again, thank you for the opportunity to respond. We would be very pleased to provide further input and clarification. Our organisation is also very well connected in California and the US and would be happy to arrange introductions to key players and thought leaders in the US

Yours sincerely,

Paul Fox, Partner

***CalCEF Clean Energy Angel Fund***

Suite 1125, 5 Third Street, San Francisco, CA 94103

United States of America

+1 415-400-8847 (office)

+1 408-250-5791 (mobile)

[www.calcefangelfund.com](http://www.calcefangelfund.com)

[paul.fox@calcefangelfund.com](mailto:paul.fox@calcefangelfund.com)